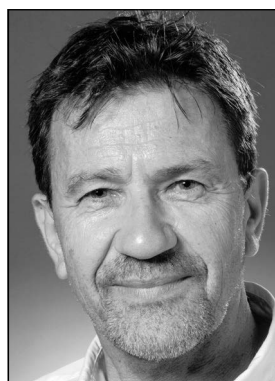




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DOES SIMULATION ADD VALUE TO CLINICAL PRACTICE? UNDERGRADUATE STUDENT NURSES' PERSPECTIVE

ABSTRACT

Aim: To evaluate if simulation adds value in preparing student nurses for clinical practice.

Background: Over a period of four years, simulation has been increasingly integrated into the bachelor of nursing (BN) curriculum in a New Zealand school of nursing. The nursing lecturers teaching in the programme decided to conduct a small research project to establish if the use of simulation in nursing education adds value to the clinical experience for students.

Method: A qualitative, descriptive approach was chosen as the methodology. A voluntary purposeful sample of nursing students enrolled across the BN programme were invited to participate in a focus group interview. The participant group comprised 10 nursing students from semester two, first year, through to final semester, year three.

Findings: Analysis of the data indicates simulation does add value in preparing students for clinical practice and the findings are categorised under the following themes: Experience and feelings of participating in simulation; preparation for simulation; learning objectives/outcomes; value for clinical practice; and how simulation could be improved to better prepare students for clinical practice.

Conclusion: Participating in simulation builds confidence, knowledge and skills and appears to add value in preparing students for clinical practice.

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KEYWORDS

Simulation, student nurses, clinical practice, nursing education.

INTRODUCTION

The use of simulation in the education of health-care professionals, to increase patient safety and reduce the costs associated with human errors, has become widespread internationally (Rothgeb, 2008). The Nursing Council of New Zealand (NCNZ) Educational Programme Standards (2010) state all students should have access to simulation learning to prepare them appropriately for clinical experiences, to ensure the safety of health consumers, students and staff. In response to this, over the past four

years, simulation has been introduced as a teaching and learning approach in the bachelor of nursing (BN) course in the nursing department of the small, provincial institute of higher education in which two of the authors work.

It has been argued that when simulation is integrated across the curriculum, better learning outcomes are achieved (Starkweather & Kardong-Edgren, 2008); therefore, simulation scenarios are integrated in all three years of the BN at this school of nursing. Low and medium-fidelity simulation is used, and the complexity of the simulation scenarios and the fidelity level are increased over the

three years. Fidelity refers to the realism of the simulation (Baillie & Curzio, 2009). Low-fidelity simulations generally use static models or task-trainers to teach basic psychomotor skills, eg basic life-support manikins. Medium-fidelity simulations have more realism, using manikins that have built-in software to display differing breathing patterns, heart rates and verbal responses. High-fidelity simulation uses sophisticated, computerised lifelike manikins which have realistic physiologic responses, such as pupil reaction to light (Lee, Lee, Lee & Bae, 2016).

Bevan, Joy, Keeley and Brown (2015) recommend matching simulation content with theory and course content; therefore, each scenario relates to the courses in which the students are enrolled. To deepen the connection between the simulations and contemporary nursing practice, the NCNZ (2012) competencies for registered nurses are used to provide the framework for the learning objectives: professional responsibility; management of nursing care; interpersonal relationships and interprofessional health-care; and quality improvement. The Gibbs reflective cycle (1988, cited in Barbour, 2013) is used as the debriefing model, following the scenario. The reflective cycle begins with a description of the situation (simulation scenario) and guides the learners to explore their feelings, evaluate what was good and bad about the situation, analyse the situation to make sense of it, and consider what else could have been done. The final step is to formulate an action plan for the learner to implement, if faced with this situation again in the real clinical setting.

Reflection was selected as the model for debriefing, because the act of reflection empowers nurses in both educational and professional realms (Barbour, 2013). Debriefing takes place in small groups of participants and observers. The benefits of reflecting in groups include developing confidence, being supportive, helping to highlight and enhance aspects of practice, improving the patient's experience of care and problem-solving (Bulman & Schutz, 2013).

LITERATURE REVIEW

The purpose of simulation in undergraduate nursing education is to prepare students for situations they may encounter in the clinical setting (Harder, 2010). Health-care environments are becoming more challenging, with increasing patient acuity, shorter hospital stays, increased use of technology, and patient safety and ethical issues becoming more of a concern (Bambini, Washburn & Perkins, 2009; Meyer, Connors, Hou & Gajewski, 2011; Secomb, McKenna & Smith, 2012). The challenge for nursing schools is to produce knowledgeable, skilled and safe graduates (Kirkman, 2013; Meyer et al, 2011; Secomb et al, 2012) at a time when clinical placement opportunities are decreasing and student numbers are increasing, which ultimately has an impact on the opportunities for and variety of clinical exposure nursing students may gain (Meyer et al, 2011; Norman, 2012; Secomb et al, 2012).

Successful learning in nursing education requires active student participation, discussion, observation and reflection, and simulation is a teaching method which incorporates all of these elements (Rothgeb, 2008). Simulation provides a unique opportunity for experiential learning and evaluation, where learners can integrate theory and practice without the fear of harming patients (Bambini et al, 2009; Bultas, Hassler, Ercole & Rea, 2014; Decker, Sportsman, Puetz & Billings, 2008). Nursing students learn in a safe environment

that enhances critical thinking and collaboration (Curtin & Dupuis, 2008).

An evident gap in the literature is the lack of data on the effectiveness of simulation and whether the knowledge gained in simulation is transferred to the clinical setting (Goodstone et al, 2013; Kirkman, 2013; Norman, 2012; Rutherford-Hemming, 2012). A major factor associated with this is the lack of a standardised, consistent evaluation tool which specifically measures simulation effectiveness (Bultas et al, 2014; Harder, 2010).

Research studies have found simulation improves student nurses' skills and knowledge in the clinical setting (Cant & Cooper, 2009; Harder, 2010; Meyer et al, 2011; Norman, 2012; Rutherford-Hemming, 2012). Improved critical thinking and clinical decision-making were also areas found to have improved following simulation (Cant & Cooper, 2009; Goodstone et al, 2013). Research findings are less clear about whether simulation improves the student's level of confidence. Most of the studies that looked at confidence levels found students felt more confident in the clinical setting following participation in simulation (Cant & Cooper, 2009; Goodstone et al, 2013; Harder, 2010; Norman, 2012; Rutherford-Hemming, 2012). However, two studies were unable to determine any improvement in confidence following simulation (Alinier, Hunt, Gordon & Harwood, 2006; Secomb et al, 2012).

Further research is needed to explore whether the use of simulation in nursing curricula leads to positive outcomes for students and nursing education (Harder, 2010; Jeffries, 2007). Norman (2012) also argues for further research related to the transfer of simulation outcomes to the clinical setting.

AIM

The aim of this project was to evaluate whether simulation adds value in preparing student nurses for clinical practice.

THEORETICAL UNDERPINNING

The principles of adult learning theory founded by Knowles (1980) provide the theoretical underpinning for this study. Knowles describes adult learners as having past experiences to draw on and liking to be self-directed in their learning; therefore teaching techniques such as problem-solving and simulation are relevant methods for this group. He also states adult learners want to be able to apply their knowledge and skills; therefore teaching and learning should emphasise experiential techniques and practical application.

METHODS

A qualitative descriptive approach was chosen for this project.

Ethical approval to conduct this study was obtained from the institution's research committee. Ten nursing students participated in the focus group interview. There were two students from each semester, starting with second-semester year one students through to final-semester year three. There were nine female participants and one male. Participants ranged in age from 20 to 48 years, with the average age being 26. Two participants identified as Māori, one identified as Korean and the remainder as New Zealand European. Nine of the students had actively participated in simulations and had also been in observer roles; one student had only been in an observer role. Students are recognised as vulnerable participants, so the interviewer, who is also a lecturer on the BN programme, and

the researcher acknowledged this and informed students they should speak honestly and openly without feeling this would jeopardise them in any way. The interviewer also confirmed their identity would remain anonymous and they would not be able to be individually identified in dissemination of the research findings.

Data collection was guided by a semi-structured interview schedule, as this allows freedom to ask questions in any order and enables the interviewer to follow tangents or seek clarification (Schneider, Whitehead, Lobiondo-Wood & Haber, 2012).

To ensure the data collected from the focus group was valid, the interviewer fed back main points to the student participants to check that the summary of the interview was an accurate depiction. The transcribed interview was also emailed to the students to ensure the data was accurate.

ANALYSIS

A current data set method was chosen to analyse the data (Russ-Eft & Preskill, 2009). This approach can be used in qualitative data analysis when a pre-existing framework could limit the full range of findings, and is a systematic and rigorous approach that leads to credible and valid results (Russ-Eft & Preskill, 2009). The focus group interview was audio-recorded and then transcribed. The transcribed data was inductively reviewed to identify and develop categories. A numerical coding system was used to allocate the data into the categories. This approach can also be referred to as free form analysis, where there is no set process or specific instructions to follow, but it is appropriate for analysing descriptive qualitative research (Harding & Whitehead, 2012). An experienced researcher was engaged to moderate the data and validate the analysis and categories.

FINDINGS

Analysis of the data indicated most students found simulation a positive learning experience. It also highlighted some aspects of simulation which could be improved. The findings are categorised under the following themes:

- ▶ Experience of and feelings about participating in simulation;
- ▶ Preparation for simulation;
- ▶ Learning objectives/outcomes;
- ▶ Value for clinical practice; and
- ▶ How simulation could be improved to better prepare students for clinical practice.

Experience of and feelings about participating in simulation

Participants described feeling nervous about participating in simulations. Participants from the first and second year of the programme commented respectively, *"I feel very nervous, I don't want to be the person to go in"* and *"I feel scared and petrified and then I freeze up"*. However, a third-year participant responded, *"You get less nervous the more you do it and the further you get through the degree"*.

Participants all agreed they felt safe in the simulation environment, particularly in the debriefing session after the scenario. In the debriefing, the students who have actively participated in the scenario describe their impressions, feelings and emotions immediately after the simulation has finished. One of the participants said, *"It is good*

talking it over afterwards, it is constructive", while another added, *"the criticism is positive, nothing is negative"*.

Preparation for simulation

Participants considered themselves well-prepared for the simulations. The simulation sessions are timetabled, so they know at the beginning of the semester when they are scheduled to occur. The participants reported that teachers posted all the information they needed about the simulation online for pre-reading and preparation. An unexpected finding was that participants in the second and third year thought they were given too much information before the simulation and suggested less information should be provided. One suggested there should be a progressive decrease in the information provided: *"More information is good in the early semesters, but I think it should be less as you get through the degree."* Another saw the amount of information as discouraging reflective practice: *"Sometimes there is too much information given. Having less information will make us think more."* Another was concerned that getting a lot of information beforehand further removed the simulation from reality, noting that *"some [simulations are] not so realistic because we are given all the details before and so there is plenty of time to prepare – felt more prepared than would in real life."*

More recently, students have been given time before starting the simulation to become familiar with the scenario by reading the simulated patient's records and reviewing all the documentation, and developing and discussing their plan of care. This mimics what occurs in practice when nurses have an opportunity to read patient notes prior to planning care. The participants reported this was very beneficial as *"it was good having the time before the simulation started to read through the notes, just like we do in clinical"*.

Learning objectives and outcomes

It has been noted in the literature (eg Jeffries, 2007) that objectives are essential in simulation as they guide the learning, so students should have an awareness of the learning objectives of the simulation. Accordingly, all the simulation learning outcomes are documented on the scenario template – a simulation lesson plan which is consistently used throughout the BN. This template informs students of the requirements of the simulation and provides relevant teaching and learning materials. Although this information is posted online two weeks before the date of the simulation, participants generally all agreed they were unaware of the learning objectives/outcomes of simulation. Participants' comments included: *"not sure what the objectives are"*, *"what you [lecturers] want us [students] to get out of it, we don't actually look at"* and *"I think they are all on [Moodle]"*.

Value for clinical practice

All participants agreed simulations had a very positive impact on their clinical experiences. Most reported being in very similar situations in clinical practice as they had experienced in simulations and being able to apply what they had learnt from the simulation to the clinical situation. A common response was that participants noted the difference it made to their interactions with patients. One said: *"the primary health care simulation is very true to life – made an impact on my own way I deal with patients"*. Another added: *"When I was in semester one when you go to the hospital for the first time, you are*

1. E-learning software

focused on taking pulses and temperatures and I forgot to say hello and introduce myself. Simulation highlighted the need to introduce yourself, so now the first thing I do is say hello and introduce myself."

One student described how it had provided the opportunity to prepare for challenging practice experiences as *"second semester simulation was a dementia patient yelling at me. I had never had that happen to me before and when I went to my placement the simulation was critical"*.

The simulations also prompted students to move beyond a focus solely on the patient. As one participant observed, *"family members in simulations reminded me the family do exist and to remember they are there. I always acknowledge the family now"*.

How simulation could be improved to better prepare students for clinical practice

Four of the participants suggested having more simulations, with a greater variety of scenarios. On the use of manikins, there was agreement that *"there is a place for the manikin; it is not ok to practise skills on patients"*. However, all the participants thought the technological features of high-fidelity manikins were not needed at their level, agreeing that low and medium-fidelity simulations were adequate to meet their learning needs. For example, two participants commented respectively, *"high-tech manikins, Sim Man, not necessary for nursing students"* and *"not necessary, what we have meets our needs"*.

Technological problems with microphones and sound had an impact on the realism of the simulation when using the manikin, which might explain why most of the participants preferred *"having real people instead of the manikin"*. The participants reported these simulations were more realistic, particularly the communication component.

DISCUSSION

The findings of this study indicate that, from a student perspective, simulation adds value in preparing them for clinical practice in the real world.

Students initially feel nervous about being involved in simulations because they are being observed and judged by lecturers and peers. However, it appears the more simulations they are involved in, the less nervous they become; this study found third-year students were more relaxed about their participation. Horsley (2012) attributes the level of anxiety and nervousness to nursing lecturers observing the students in the simulation; whether lecturers were present in the simulation room or in a control room, the students felt they were being watched. The visibility of the lecturer, or any interruption they may make, can negatively affect the students' critical thinking and problem-solving skills (Jeffries, 2007).

The lecturer as facilitator has a crucial role in defusing student anxiety by ensuring the learning environment is safe for students – guided reflection during the debriefing stage is an essential component of this. Students need guidance to enable them to receive feedback in a positive rather than negative way. As noted by Dreifuerst (2009), their strengths and challenges should be drawn out in a non-threatening manner, while at the same time facilitating emotional release, as students' emotions can inhibit learning. Allowing time for emotional release redirects the students to reflective learning.

Preparation for simulation is an important aspect of the learning experience and Jeffries (2007) recommends students are briefed before the simulation about content, expected conduct, safety and available resources and information. This needs to be balanced against providing students with too much information specific to the simulation, as this may not support their learning. This study indicates more preparation is needed in the first year, when students are being introduced to simulation, and less information should be given as students progress into the second and third years. Cordeau (2012) suggests novice student nurses become anxious when they do not know what to expect, whereas students with more experience apply their existing knowledge when preparing for simulations. Page-Cuttrara (2014) describes the simulation process as having three components: pre-briefing, scenario and debriefing. The pre-briefing stage relates to the preparation students need to enable them to develop complex thinking skills and clinical judgment. She goes on to say the pre-briefing stage may provide the opportunity for students to engage more fully in the learning. Novice student nurses may benefit from more preparation in the pre-briefing stage, whereas more experienced student nurses may value less structure, to mimic the reality of clinical practice (Page-Cuttrara, 2014).

Providing clear expected learning outcomes for the simulation is important. Using the pre-briefing stage to clarify these outcomes is the ideal time to ensure students are aware of what the overall objectives are. Learning outcomes and simulation objectives that are outlined before participating in the scenario provide direction for students, so learning can occur and the clinical thinking process can develop (Page-Cuttrara, 2014). The NCNZ (2012) competencies for registered nurse (RN) practice provide the framework for the simulation objectives. The competencies assist curriculum development for bachelor degrees in nursing and enable student nurses to understand how RNs demonstrate competence, accountability and responsibility in their practice (NCNZ, 2012). The competencies also provide structure to the debriefing, which Mariani, Cantrell and Meakim (2014) suggest is required to achieve the overall goal of learning. During the debriefing, examples of nursing practice related to specific competencies are drawn out and reflected on. Dreifuerst (2009) suggests when debriefing is structured to promote reflection, students learn to self-correct and assimilate new and previous experiences to improve their overall professional competence. Lavoie, Pepin and Cossette (2015) say learners make sense of the situation by reflecting on what happened during the simulation.

The findings from this study indicate that what students learn from participating in simulation enhances their practice in the clinical setting, improving their confidence and performance. Although these findings cannot be generalised, similar results have been found elsewhere, suggesting these findings may be transferrable to other settings. For example, Alfes (2011) found if students enjoyed and did well in a simulation, their confidence increased and skill performance improved in the clinical setting. Similarly, in Baillie and Curzio's (2009) study, 85 percent of students who participated in simulation reported improved confidence, skill performance and knowledge in the clinical area.

It was not surprising, given the impact of simulation on students' confidence in the clinical setting, to find there were participants who argued for more simulation in the programme. Handley and

Dodge (2013) also reported that students in their study wanted more simulations. There were, however, two findings in this study that were not anticipated and have implications for further refinement of the use of simulation in the undergraduate curriculum:

- (1) a preference for the use of actors in simulations; and
- (2) a perception that high-fidelity simulation was unnecessary in undergraduate nursing education.

Although the preference for the use of actors in simulations was unexpected in the context of this study, it has been reported elsewhere. In a study evaluating simulation in undergraduate nursing programmes in Australia, it was found that 96 percent of participants found simulations using actors more realistic than those using manikins (Kable, Arthur, Levett-Jones & Reid-Searl, 2013). This finding, coupled with the perception that high-fidelity simulation is unnecessary to increase student confidence and competence in the real world, may provide guidance to schools of nursing planning to introduce simulation in their curricula or expand its use.

A number of studies attest to the financial cost of purchasing and maintaining sophisticated simulation equipment (eg Rothgeb, 2008; Shepard, McCunnis, Brown & Hair, 2010). Effective use of simulation equipment also requires ongoing professional development for staff teaching in BN programmes (Rothgeb, 2008). This study suggests the use of low and medium fidelity simulation technology, in tandem with actors, may be more effective in enhancing students' preparedness for clinical practice.

LIMITATIONS

The main limitation of this study is that the findings are from a small cohort of participants from one school of nursing. This offers an opportunity for further research, replicating this study with a larger group of students from different schools of nursing. Another limitation is the qualitative nature of the study – being from the students' perspective. The development of a standardised simulation evaluation tool would be needed to accurately gauge the effectiveness of simulation and the transfer of learning to the clinical setting.

CONCLUSION

The aim of this research project was to understand whether simulation adds value in preparing student nurses for their clinical experiences. Although this was a small study, the results indicate simulation does add value to students' clinical practice. Participating in simulation builds their confidence, knowledge and skills, and prepares them for what to expect in the clinical environment. The learning from simulation appears to be directly transferable into clinical practice.

Lecturers have a crucial role to facilitate teaching and learning in simulation by ensuring a safe environment where students are able to make mistakes and learn from them in a constructive way. It is essential to have clear, structured learning objectives and use guided reflection in the debriefing to ensure a safe environment for learning is maintained.

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